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Study on Biomass Trade in Austria



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1 Trade Study Austria

Basic data on availability

For the production of biomass the basic requirement is land. In Austria approximately 7.5mio ha (~90% of the area) are theoretically available for agriculture and forestry. In 2008, effectively about 3.17mio ha were agricultural land and 3,34mio ha were used for forestry. 1,38mio ha of the agricultural land are arable land, the rest is grassland. (Kranzl et al. 2009 a).

Table 1: Forests and their utilisation in Austria 2007 (sm³: solid cubic meter)

	Austria	
Forested area	3,924,000	ha
Wood stored in the forests/ha	294.7	Sm ³ /ha
Total amount of wood stored in forests	988	Msm ³
Growth relative	6.9	Sm ³ /ha/a
Growth absolute	27	Msm ³ /a
Annual cut	20	Msm ³ /a
Forest biomass in energy supply	141.4	PJ/a

In the following figure, the import and export of fuel wood in tonnes for 2007 is portrayed (export: green arrows; import: yellow arrows).

Figure 1 International trade of biomass with respect to Austria (2007).

Source: Kranzl et al. 2009a

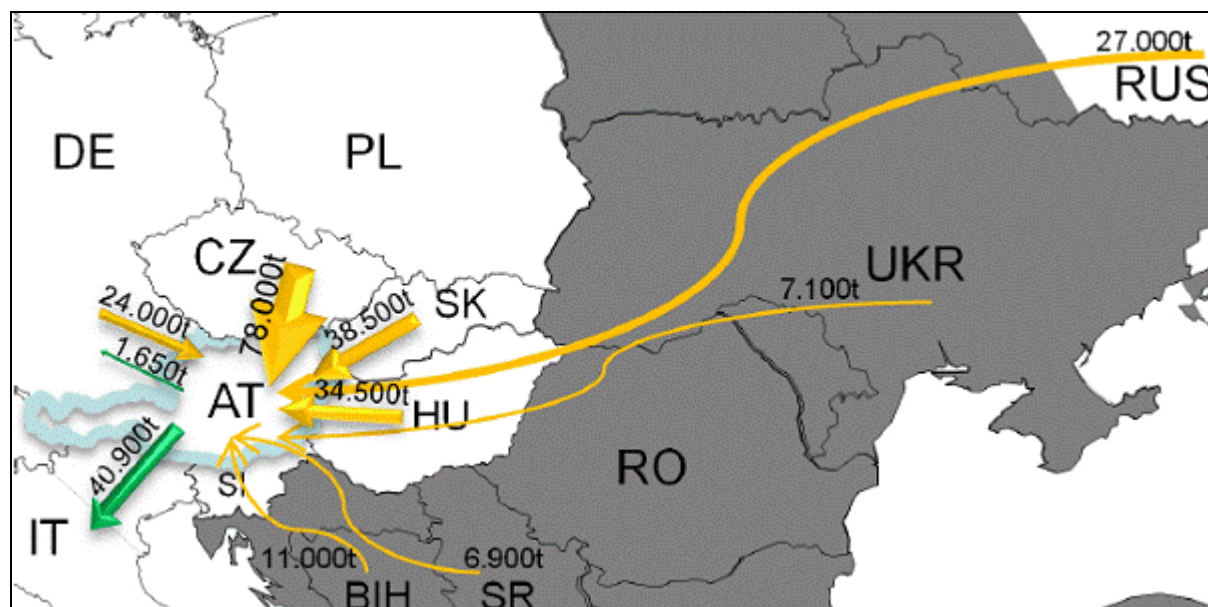
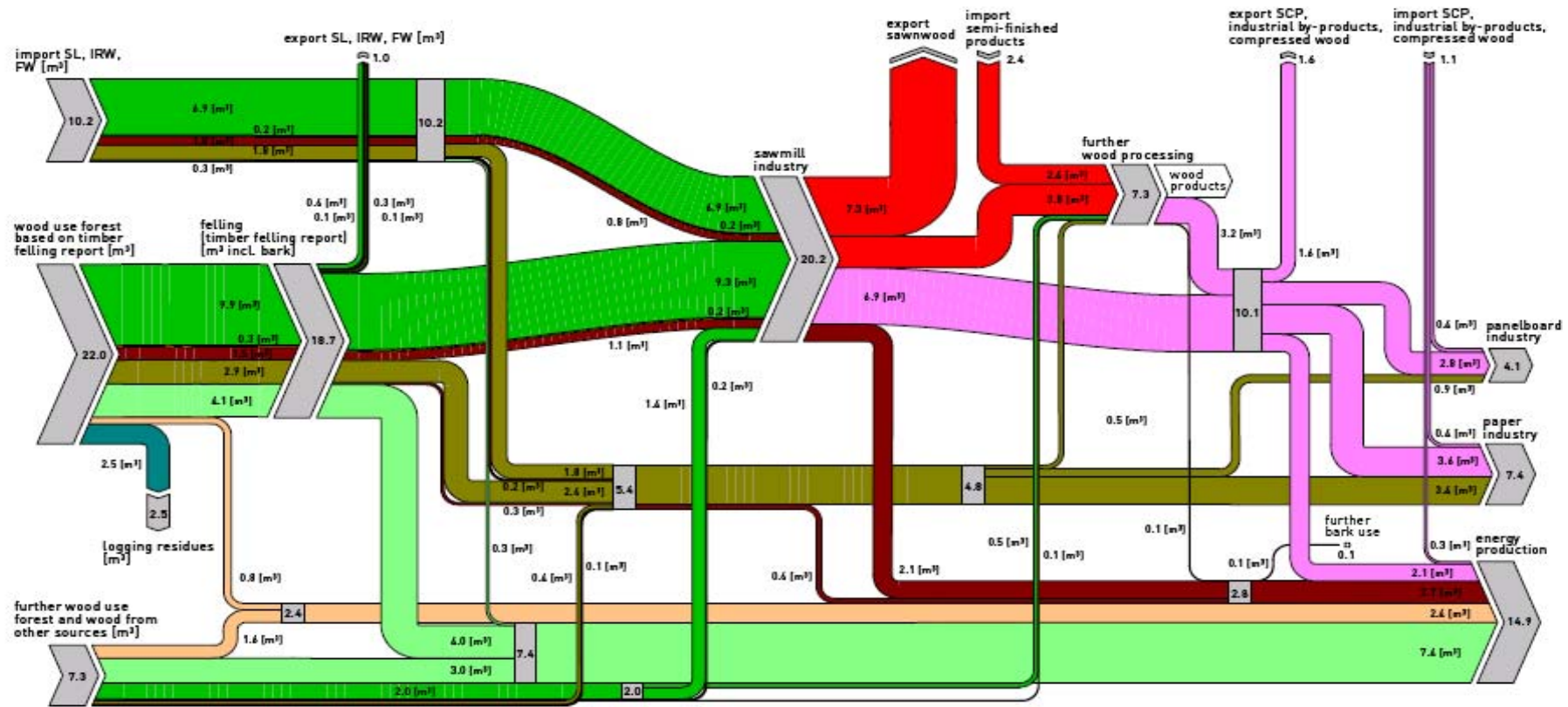


Figure 2 (see next page): Woodflow of Austria

Woodflow Austria 2005



LEGEND (all values in millions [m³]; streams < 0.1 million m³ are not shown)

- sawlogs [SL]
- industrial roundwood [IRW]
- firewood [FW] incl. bark
- logging residues
- sawmill co-products [SCP], industrial by-products, compressed wood
- off-cuts
- bark
- forest chips
- sawnwood and semi-finished products

date: november 2007

This Chart is based on the current state of knowledge and information, and has been compiled to the best of the authors' knowledge and experience. However, the authors accept no liability whatsoever for errors or omissions and reserve the right to incorporate latest findings.
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The 'Woodflow Austria 2005' is a clear presentation of the Austrian wood market. It demonstrates the way from felling through the various processing steps of the material use to the use of biomass for energy. This figure is a contribution to the improvement of market transparency by showing the complex mass flow in a clearly arranged overview.

In a nutshell, the Austrian wood demand is mainly covered by domestic sources from forests and further wood use. The rest of the demand is covered by imports. About half of the biomass, which is used for energy production is firewood and is used in households. Bark is nearly fully used for energetic purposes. Together firewood and bark cover 70 percent of the demand. The remaining 30 percent are forest chips, sawmill co-products, industrial by-products and compressed wood.

A realistic potential for the annual production of forest-biomass in Austria is 25 to 28 Msm³ in 2020. This translates to an increase of 40 to 55%, as compared to the years 2005 to 2007, or 30 to 56 PJ/year of additional primary energy, in case all of it would be used for energy purposes.

According to a study issued by the Federal Ministry of Agriculture and Forestry, Environment and Water Management, (www.lebensministerium.at) the total potential of forest biomass in 2020 will be within a bandwidth of 23.9 to 31.1 sm³ per year, mainly depending on the frame-conditions like price for wood, infrastructure for harvesting, etc.

Biomass trade

The following section focuses on a description of cross border trade with biomass for bioenergy in Austria. Thus, data about exports and imports for different biomass and bioenergy products (woody biomass, liquid biofuels and agricultural feedstocks for the production of biofuels) are presented.

The study mainly refers to the work carried out by Lukas Kranzl, Fritz Diesenreiter, Gerald Kalt (2009 a): Sustainable International Bioenergy Trade: Securing supply and demand. Country Report Austria 2009, which comprises the Austrian contribution to the requirements of IEA task 40.

For an overview about trade flows of forestry and agricultural biomass products, table 2 gives an extraction of the Austrian foreign trade statistics for 2008. It shows that foreign trade with cereals, oilseeds, cork, wood and animal and vegetable oils and fats in Austria is concentrated to European countries. Only in the field of imports of oil-seeds and oleaginous fruits the Americas and Asia play a minor role with a share of 5%. With a share of 8,5% of exports of cork and wood Asia plays a minor role in this field.

Table 2: Foreign trade of selected product groups in Austria in 2008; Source: Statistik Austria, Außenhandel: Tabellen zum Schnellbericht Dez. 2008

SITC classification	Total in 1000€		Europe (share in %)		Africa (share in %)		Americas (share in %)		Asia (share in %)	
	Import (I)	Export (E)	I	E	I	E	I	E	I	E
4 Cereals and cereal preparations	801.608	873.508	98,2%	98,9%	0,0%	0,1%	0,8%	0,4%	1,0%	0,6%
22 Oil-seeds and oleaginous fruits	235.939	154.314	89,4%	99,5%	0,2%	0,0%	5,4%	0,1%	5,0%	0,4%
24 Cork and wood	1.060.643	1.598.678	98,6%	87,4%	0,2%	2,7%	0,9%	0,4%	0,4%	8,5%
40 Animal and vegetable oils, fats and waxes	404.485	169.331	98,0%	99,6%	0,1%	0,0%	0,4%	0,2%	1,5%	0,2%

In the following section the major trade flows for woody and agricultural biomass and bioenergy products will be described.

Woody biomass

Austria is a densely wooded country. Nearly 50 percent (3.9 million ha) of Austria is forest, according to the Austrian forest inventory (1986/90). Commercial forestry takes place in a high proportion of this area, which translates to 86% or 3.3 million ha. In other words, the Austrian forest and wood industries is a well developed business sector. Due to the large role of the Austrian wood processing industry, Austria is a major importer of round wood and exporter of wood products. In the following section the imports and exports and the major trade flows for fuel wood, wood chips, sawdust, wood waste or scrap and pellets will be described.

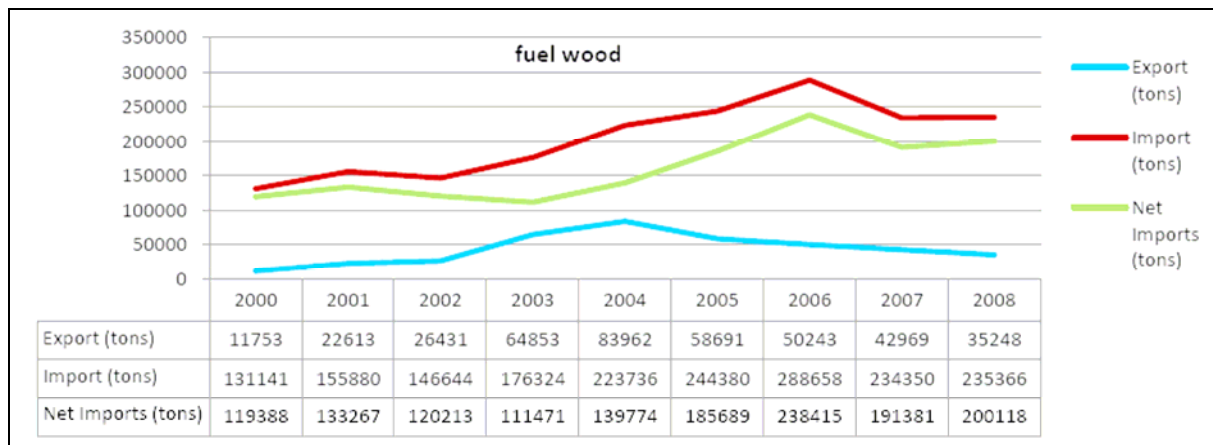
Fuel wood

In Austria approximately 20% of the heating energy demand is covered by fuel wood. This means that at present fuel wood is the most important bioenergy product in Austria. The annual demand for fuel wood in Austria is estimated to amount to approximately 7,500,000m³. The largest share of the demand for fuel wood is covered by domestic forests. Net imports only represent about 4% of the Austrian demand for fuel wood.

As shown in figure 3, Austria is a net importer of fuel wood. In the period from the year 2000 to 2008 the amount of imports of fuel wood has been increasing from 131,000 t to up to 235,000 t, with a peak of 289,000 t in the year 2006 relating to a very long and snowy winter. In 2008, 235.000t of fuel wood have been imported and 35,000t have been exported, thus the net imports have been 200,000t. The main countries of importation of fuel wood are the Czech Republic, Slovakia, Hungary, Russia and Germany. Almost all exports (95%) are going to Italy.

In relation to the overall consumption of fuel wood, the volume of international trade is very low (about 4% in 2008).

Figure 3 Development of foreign trade of fuel wood in Austria in tonnes;
Source: UN Comtrade Database, 2009



Wood chips

In Austria, the particle board industry and the paper industry are very well developed. Furthermore, in recent years the number of district heating stations and combined heat and power plants has been rising. Consequently, the demand for timber and saw mill residues for energy recovery has increased steadily. The Austrian sawmill industry is producing approximately 4,550,000m³ of woodchips. Additionally, in 2007 and 2008 about 1 million m³ of coniferous (the biggest part) and non coniferous wood chips have been imported, mainly from Germany (80%) and to some extent from the Czech Republic (12%). Italy is again the most important consumer of Austrian wood chips with a share of 85%.

Figure 4 Development of foreign trade of wood chips in Austria in tonnes;
Source: UN Comtrade Database, 2009



It has to be noted that only part of these trade volumes are used for bioenergy.

Sawdust, wood waste or scrap, including wood pellets and briquettes

The following figure (fig. 5) shows the development of foreign trade of sawdust, wood waste or scrap in Austria. The two products wood pellets and briquettes are included in this data. Since the development of the wood pellets market has been highly dynamic in Austria, more detailed information on the trade of wood pellets can be found in the next section.

In the last couple of years there has been a strong increase in the demand for these products, mainly due to the strong increase of the pellets production and consumption in Austria. In the period between 1996-2000 the average amount of imports of this products group was about 167,000 tons, in 2008 there was an increase to 685,000t. In the same period the exports of this products group increased from an average of 341,000t to 777,000 tons in 2008.

Figure 5 Development of foreign trade of sawdust, wood waste or scrap in Austria in tonnes; Source: UN Comtrade Database, 2009

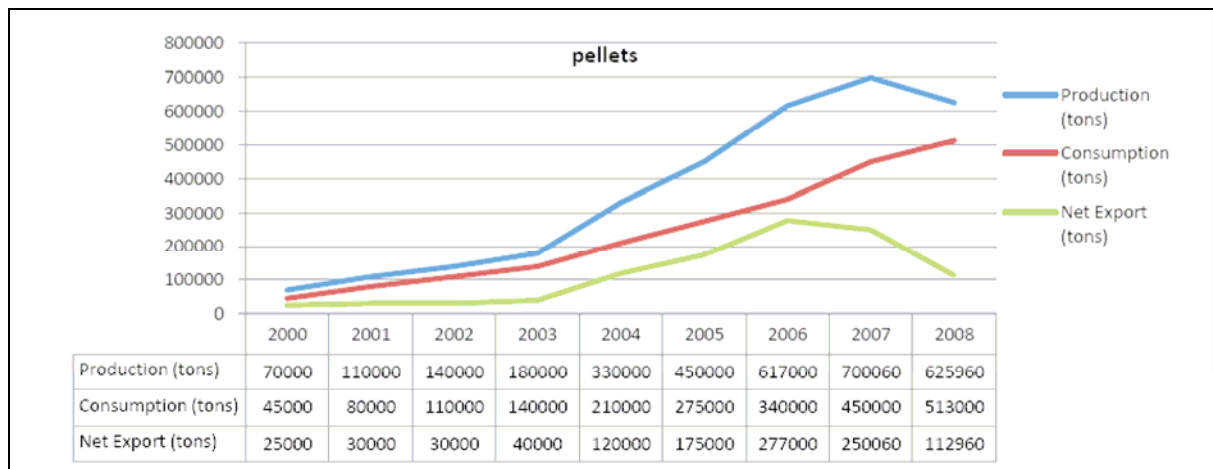


It has to be noted that only part of these trade volumes are used for bioenergy.

Pellets

Austria is one of Europe's major pellet exporters with a production capacity of 978,000 tons and a production of 626,000 tons in 2008. A total amount of about 250,000 tonnes (in bags), nearly 100 % of the export potential of 2008, was exported to Italy. In 2008. The import of pellets is estimated at 146,000 tonnes. The most important import countries are Germany (~ 70,000 tonnes) followed by Czech Republic (~ 43,000 tonnes) and Romania (~ 27,000 tonnes). Additionally, small amounts of pellets are imported from Slovakia and Slovenia (~ 3,000 tonnes each). Trucks transport the pellets.

Figure 6 Development of foreign trade of wood pellets in Austria in tonnes;
Source: proPellets, Pellets@tlas Project, 2009



Liquid biofuels and agricultural feedstocks for the production of biofuels

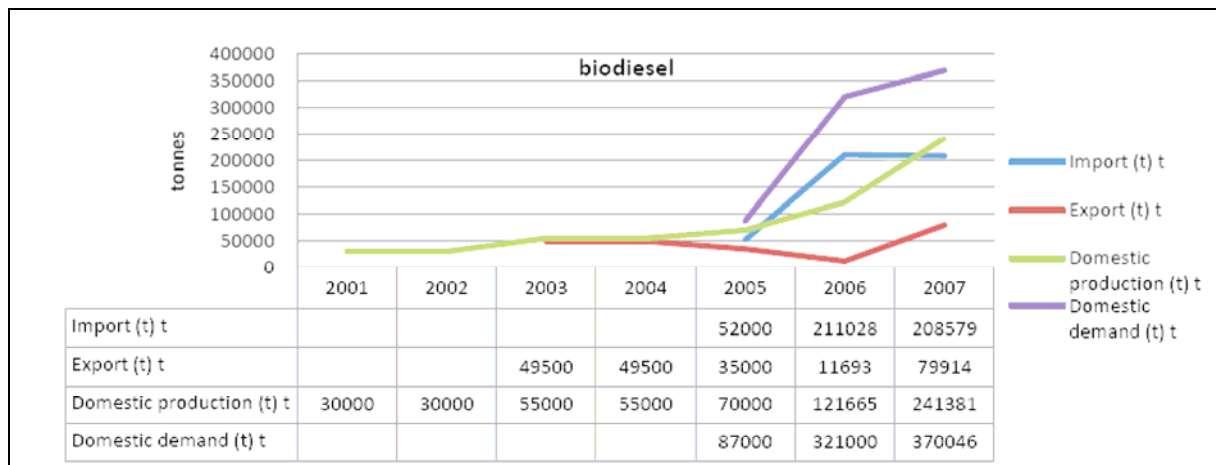
In recent years with the introduction of the European Biofuel Directive and the implementation of an obligatory quota for biofuels the use of agricultural products for the production of energy has steadily gained importance. On 4 November 2004, the Biofuel Directive was transposed into Austrian national law with an amendment to the Fuel Ordinance. This amendment stipulates that all companies that put fuels in circulation (e.g. OMV), must replace a certain amount of the total energy quantity put in circulation, with biofuels. In Austria, since October 1st, 2005, 2.5% of fossil fuels had to be replaced by biofuels. On October 1st, 2007 this value has been increased to 4.3% and since October 1st, 2008 the value is 5.75%.

Biodiesel

In the mid 1990s, the industrial production of biodiesel started in Austria. Through the implementation of the Biofuels Directive in 2004 in Austria, a real boom in the production of biodiesel was triggered and from 2005 to 2008 there was a sharp increase in the production capacity. Until mid 2008, 18 biodiesel plants existed in Austria with an annual production capacity of approximately 560,000t.

In Figure 7 the development of the Austrian biodiesel market can be seen. In 2007, the domestic demand for biodiesel was 370,000t in Austria. According to the report "Biofuels in the transport sector in Austria" which is published annually by the Austrian Federal Environment Agency (Umweltbundesamt), 300,000t have been used for the blending of fossil diesel and 70,000t have been used in pure form in 2007. With a domestic production of 241,000t and exports of 80,000t approximately 210,000t of biodiesel had to be imported. Thus in 2007, Austria was a net importer of 130,000t of biodiesel.

Figure 7 Development of foreign trade of biodiesel in Austria in tonnes; Source: Austrian Federal Environment Agency (Umweltbundesamt), 2009



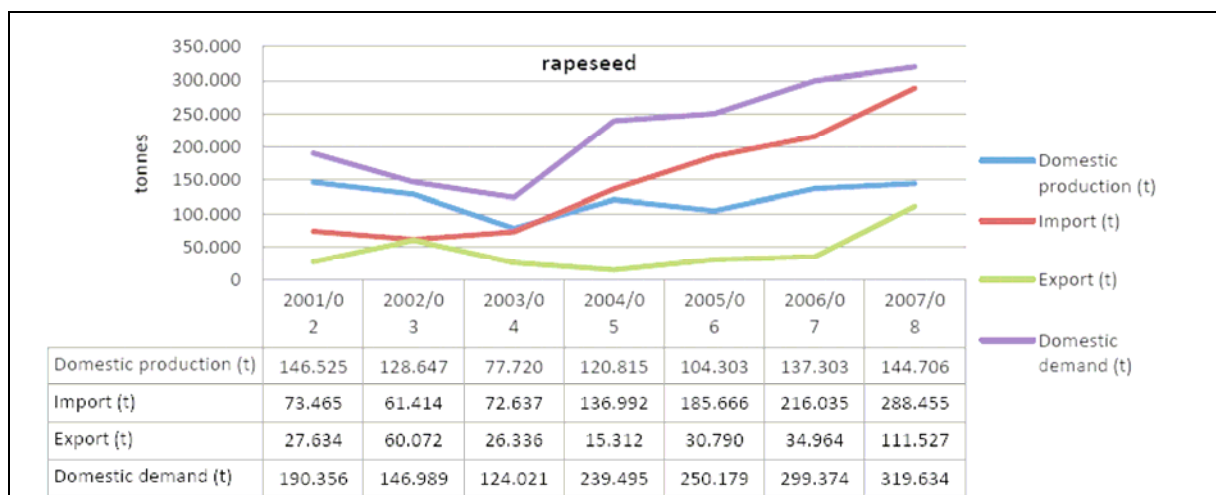
Even though poor documentation of the trade flows of biodiesel and the trading partners in Austria exist, it can be estimated that Germany is the most important import country for Austria.

Rapeseed oil is the main feedstock for the production of biodiesel in Austria. Rapeseed oil is either produced in Austrian oil mills or it is imported from other countries. In the following data foreign trade of the most important feedstocks for the production of biodiesel will be presented.

Rapeseed

According to the supply balance sheets for oilseeds in Austria, the annual average demand for rapeseed before the implementation of the Biofuels Directive was relatively constant, at a level of about 150,000t in the period between 2001-2004. There was a sharp increase in the demand for oilseeds of up to 320,000t in 2007/08 with the implementation of the Directive (see fig. 8). This increase of 170,000 tons can be attributed to the production of biodiesel.

Figure 8 Development of foreign trade of rapeseed in Austria in tonnes; Source: Statistik Austria, supply balance sheets for oilseeds, 2009

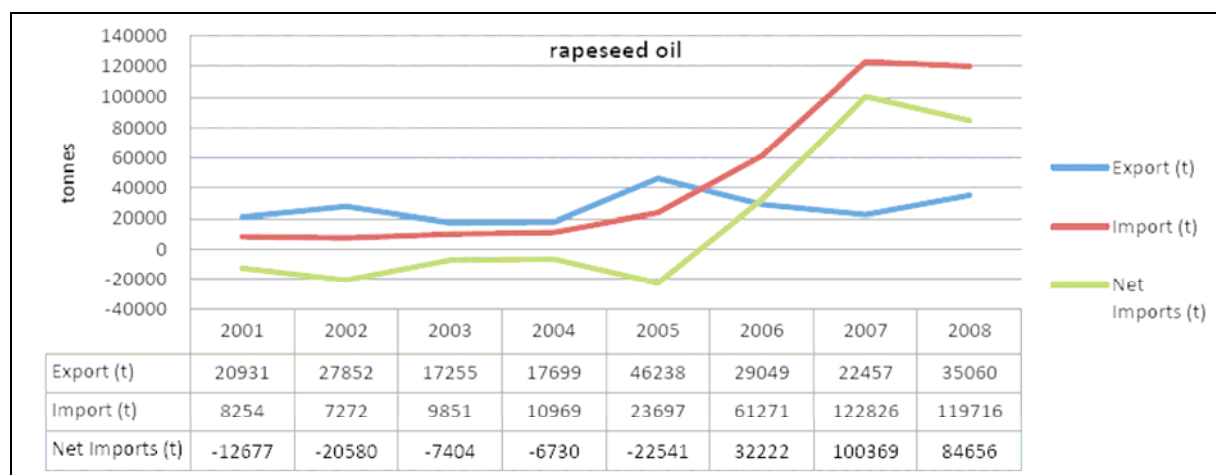


In relation to the great domestic demand for rapeseed, the degree of self sufficiency decreased from more than 80% in the period of 2001-2003 to 45% in 2007/08. Consequently, there was a strong increase in imports of rapeseed in the last few years, mainly from Hungary (147,000t), Slovakia (66,000t) and the Czech Republic (42,000t). The largest share of Austrian exports have been going to Germany (74,000t).

Rapeseed oil

Next to rapeseed oil that is extracted in oil mills in Austria, imports of rapeseed oil are very important for the Austrian biodiesel industry. Austria has been a net exporter of rapeseed oil until the year 2005. This has changed completely with the implementation of the Biofuel Directive in Austria. In the period from 2005 to 2007, there has been a substantial increase in the imports of rapeseed oil. In 2008, the net imports have reached a level of 85,000t. This is a reduction of 15% compared to 2007. The most important countries for imports of rapeseed oil to Austria are Germany with a share of more than 50%, Slovenia (8%), Serbia (7,5%), Romania (6%), the Czech Republic (5.5%) and Poland (5.5%). One third of the Austrian export goes to Germany, the rest to other neighbouring countries.

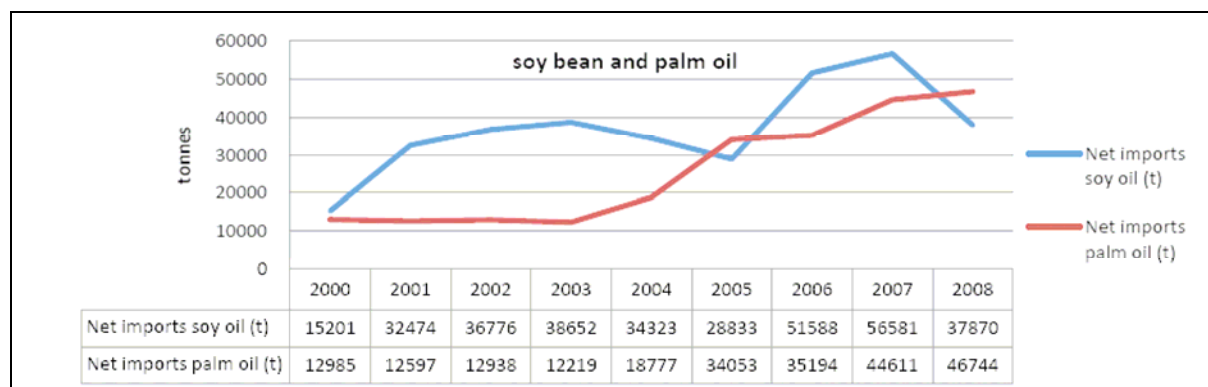
Figure 9 Development of foreign trade of rapeseed oil in Austria in tonnes; Source: UN Comtrade Database, 2009



Soy and palm oil

Even though soybean and palm oil are not used for the production of biodiesel in Austria, there has been a substantial increase in the imports of these vegetable oils, as can be seen in figure 10. It is assumed that ever more rapeseed oil was needed by the biodiesel industry, and thus it was missing in the production of margarine and other cooking fats. As a trade-off there has been an increase in the imports of soybean- and palm oil during this period of time.

Figure 10 Development of foreign trade of soybean and palm oil in Austria in tonnes;
Source: UN Comtrade Database, 2009



Palm oil is imported mainly via the Netherlands and Germany from Malaysia and Indonesia. Soybean oil is mainly imported from Serbia and Germany.

Ethanol

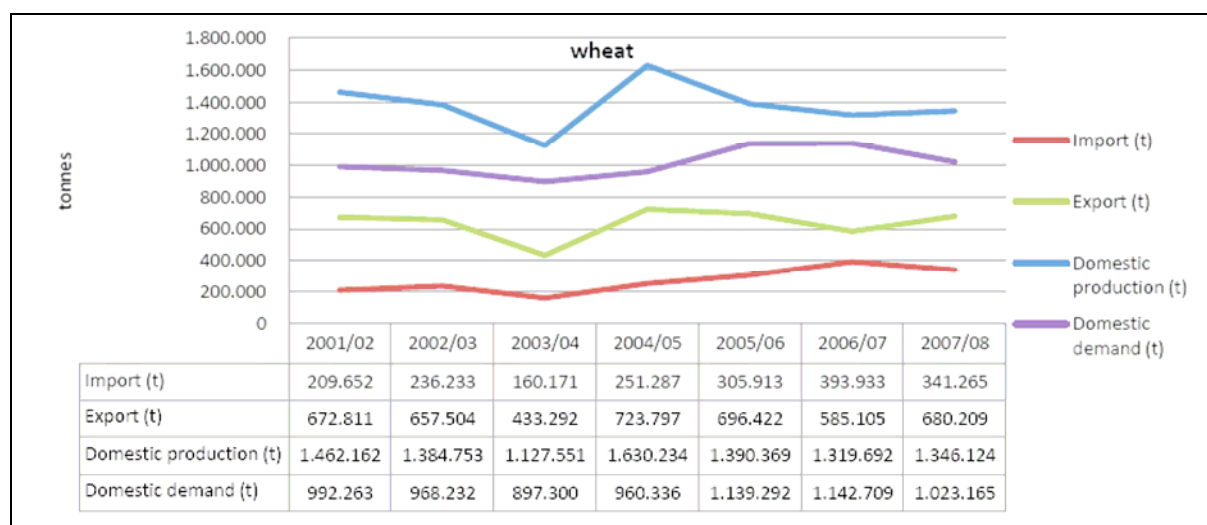
In Austria, only one plant for the production of ethanol exists. The plant in Pischelsdorf has an annual production capacity of up to 240,000m³ (~190,000t). This is enough to supply the Austrian demand for ethanol. The production of ethanol in this plant started in 2007. After a production of 12,000t of ethanol, the production had to be stopped due to the skyrocketing prices of wheat in the second half of 2007. In Austria, the blending with gasoline started in the last quarter of 2007 with a domestic demand of 20,000t. This means that 8,000t of ethanol had to be imported. The production in Pischelsdorf was resumed in June 2008, when wheat prices had declined to a lower level.

In the plant in Pischelsdorf ethanol is produced by using wheat, corn and sugar beet syrup. According to information of the company for the production of 240,000m³ of ethanol, 400,000 tons of wheat, 100,000 tons of corn and 50,000 tons of sugar beet syrup are needed. Therefore, the following data presents foreign trade of wheat and corn.

Wheat

Austria is a net exporter of wheat up until now. In the period of 2007/08 the domestic production of wheat amounted to approximately 1.35 million tons, while the domestic demand was about 1 million tons. The annual yields of the wheat production are obviously strongly influenced by weather-conditions. Therefore the potential amount of wheat which is available for export is very volatile. With an additional demand of 400,000t of wheat for the production of ethanol in Pischelsdorf, Austria could turn from a net exporting to a net importing country.

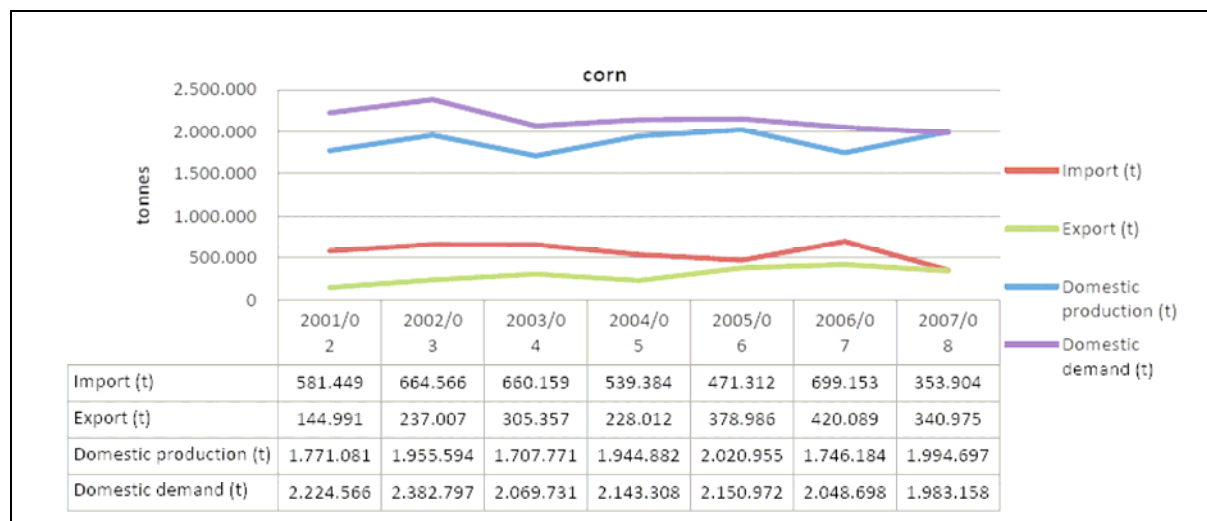
Figure 11 Development of foreign trade of wheat in Austria in tonnes;
Source: Statistik Austria, supply balance sheets for cereals, 2009



Corn

Corn is, at least on a quantity basis, the most important type of grain in Austria. Almost 2 million tonnes of corn have been produced during 2007/08. As can be seen in figure 12, the ratio of domestic production to domestic demand and the ratio of imports to exports are well balanced. Since the amount of corn which is needed for the production of ethanol in Pischelsdorf is relatively small, it does not significantly affect the foreign trade of corn in Austria.

Figure 12 Development of foreign trade of corn in Austria in tonnes;
Source: Statistik Austria, supply balance sheets for cereals, 2009



Bioenergy trade: Barriers & opportunities

When it comes to Bioenergy Trade in Austria, two biomass and bioenergy products play a key role: on the one hand oil seeds and as a result vegetable oil for the production of biodiesel, and on the other hand wood pellets.

In reference to vegetable oils, Austria has had a high degree of self-sufficiency in the past. With the implementation of the Biofuel Directive this has changed completely in Austria: during the period from 2005 to 2007 there has been a strong increase in the imports of rapeseed oil, and Austria has been a net importer of rapeseed and rapeseed oil since then.

The production of pellets has been a real success story in Austria,. Austrian producers of pellets were benefiting strongly of the demand from neighbouring countries in the past, and in 2007 approximately half of the production volume has been exported (as described above mainly to Italy). Nevertheless, the production of pellets is linked to the development of the wood processing industry.

In Austria, sustainability is very important for the consumers' acceptance of biofuels. The increase in the prices for agricultural commodities (and with it the prices for food) in 2007/08 was attributed to the production of biofuels from the public opinion. To increase the consumer acceptance of biofuels, the certification of sustainability will be crucial to the potential future development of bioenergy in Austria.

Austria, as a landlocked country does not have direct access to the sea. Thus, in reference to international trade, Austria has a cost disadvantage compared to other European countries. International ports like Rotterdam and Hamburg can be accessed by using the Rhine-Main-Danube Canal. However depending on the seasonal fluctuations of the water level of the Danube, transport on rail and road sometimes is preferred.

In conclusion: at present, foreign trade with cereals, oilseeds, cork, wood and animal and vegetable oils and fats is for the most part limited to European countries in Austria. Except in the field of imports of oil-seeds and oleaginous fruits the Americas and Asia, and in the field of exports of cork and wood ,Asia play minor roles.

Nevertheless, with the ambitious Austrian targets for renewable energy up to 2020, foreign trade with biomass will play a more important role in the future.

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